Algebra 2 - Systems of Equations Problem Set

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1. Solve this system of equations using substitution.

$$\begin{aligned} x - 2y - z &= -5 \\ y + z &= 4 \\ \frac{5}{3}z &= -5 \end{aligned}$$

2. The sum of angles in a triangle is 180°. In triangle ABC, if ∠C is equal to the sum of the other two angles and ∠B is equal to 5A - C, what are the measures of angles A, B, and C?

3. How many solutions does the following system of equations have?

$$\begin{aligned} 5x - y &= -13 \\ -10x + 2y &= 24 \end{aligned}$$

4. Solve the systems of equations using Gaussian elimination.

$$\begin{aligned} x - 2y - 3z &= 0 \\ 2y + z &= -8 \\ -x + y + 2z &= 3 \end{aligned}$$

5. Given the systems of equations, write the augmented matrix.

$$\begin{aligned} y - x + z &= -8 \\ -2x + z &= 0 \\ x + y - 2z &= 6 \end{aligned}$$

6. On a college entrance exam, you answered 80 of the 85 questions. Each correct answer adds one point to your raw score, each unanswered question adds nothing, and each incorrect answer subtracts $\frac{1}{4}$ point. Your raw score was a 70. How many questions did you answer correctly?

7. Solve the systems of equations using Gaussian elimination.

$$\begin{aligned} 4x + y + 6 &= 7 \\ 5z &= -10 \\ -x - y + z &= -9 \end{aligned}$$

8. Solve this system of equations.

$$\begin{aligned} -3x - 3y &= 3 \\ y &= -5x - 17 \end{aligned}$$

9. A grocer combined peanuts that cost \$5.20/kg with cashews that cost \$6.40/kg. How many kilograms of each were used to make a 45-kilogram mixture costing \$6/kg?

10. Given the systems of equations, perform the row operation $R_2 - R_3 = R_2$.

$$\begin{aligned} -x + y - 2z &= 10 \\ x + 2y + z &= -6 \\ x - z &= -2 \end{aligned}$$